CLAIMS

Claim 1 A surgical device extending along an axis and having a proximal end and a distal end, the device being operable to move a suture through body tissue, comprising:

an elongate shaft having a hollow configuration;

a handle assembly coupled to the shaft;

an actuating rod having a proximal end and a distal end, the actuating rod being disposed to extend between the handle assembly and the shaft;

a needle assembly disposed at the distal end of the actuating rod and movable with the actuating rod between an extended state and a retracted state;

bifurcated portions of the needle assembly defining a suture slot, the bifurcated portions having a proximate relationship when the needle assembly is in the retracted state and having a separated relationship when the actuating rod is in the extended state;

the needle assembly being biased to the retracted state; and

the bifurcated portions being biased to the separated relationship.

Claim 2 The surgical device recited in Claim 1 further comprising:

a sharp needle included in the needle assembly and disposed distally of the bifurcated portions.

Claim 3 The surgical device recited in Claim 1 wherein the bifurcated portions include a backing arm and a gathering arm that define the suture slot with a proximal end and a distal end.

Claim 4 The surgical device recited in Claim 3 wherein portions of the gathering arm define a passage into the suture slot.

Claim 5 The surgical device recited in Claim 4 wherein the portions of the gathering arm are disposed closer to the proximal end of the suture slot than the distal end of the suture slot.

Claim 6 The surgical device recited in Claim 4 wherein the portions of the gathering arm are disposed closer to the distal end of the suture slot than the proximal end of the suture slot.

Claim 7 The surgical device recited in Claim 3 wherein the bifurcated portions of the needle assembly have an outer surface in the shape of a cylinder.

Claim 8 The suture device recited in Claim 1 wherein the bifurcated portions are first bifurcated portions defining a first slot, and the device further comprises:

second bifurcated portions included in the needle assembly and defining a second suture slot.

Claim 9 The surgical device recited in Claim 1 wherein the suture slot has a tapered configuration.

Claim 10 The surgical device recited in Claim 6 wherein the gathering arm in the retracted position of the needle assembly is free to contact the backing arm.

Claim 11 The surgical device recited in Claim 6, wherein:

the passage is defined by a proximal portion of the gathering arm and a distal portion of the gathering arm, and the needle assembly further comprises:

a stop formed on the distal portion of the gathering arm to prevent the proximal portion of the gathering arm from contacting the backing arm in the retracted position of the needle assembly.

Claim 12 The surgical device recited in Claim 7 wherein at least one of the proximal end and distal end of the slot is rounded to inhibit suture damage.

Claim 13 A surgical suturing device, including:

a needle assembly having a needle movable in a needle housing between a free suture state and a captured suture state;

a handle assembly including a longitudinal handle housing sized and configured to releasably receive the needle assembly;

a thumb slide assembly releasably coupled to the needle and movable longitudinally on the handle housing between a distal position and a proximal position;

the distal position of the thumb slide assembly being associated with the needle in the free suture state; and

the proximal position of the thumb slide assembly being associated with the needle in the captured suture state.

Claim 14 The surgical suturing device recited in Claim 13 wherein:

the needle is movable in the needle housing between a free suture state, a captured suture state, and a locked suture state;

the proximal position of the thumb slide assembly is associated with the needle in the locked suture state.

Claim 15 The surgical suturing device recited in Claim 13 wherein the handle housing and the thumb slide form a ratchet at the distal position of the thumb slide assembly.

Claim 16 The surgical suturing device recited in Claim 13, further comprising:

a needle lock included in the thumb slide assembly and having a releasable locking relationship with the needle.

Claim 17 The surgical suturing device recited in Claim 16, further comprising:

a needle housing lock carried by the handle housing and having a releasable locking relationship with the needle housing.

Claim 18 The surgical suturing device recited in Claim 17, wherein:

the needle housing lock is pivotal on the handle housing between an unlocking position and a locking position.

Claim 19 The surgical suturing device recited in Claim 18, further comprising:

a locking detent slidable on the handle housing between a first position wherein the needle housing lock is pivotal on the handle housing to the unlocking position, and a second position wherein the needle housing lock is held in the locking position.

Claim 20 The surgical suturing device recited in Claim 19 wherein the second position of the locking detent is distal of the first position of the locking detent.

Claim 21 The surgical suturing device recited in Claim 13, wherein:

the thumb slide has a detent position between the distal position and the proximal position;

the thumb slide in the detent position is associated with the handle in the captured suture state and an unlocked suture state; and

the thumb slide in the proximal position is associated with the needle in the captured suture state and a locked suture state.

Claim 22 A method for placing suture across a body wall of a patient, comprising the steps of:

providing a suture device including a hollow shaft with a proximal end and a distal end, an actuating rod disposed in the shaft, and a needle assembly carried by the rod between a deployed position and a retracted position;

providing the needle assembly with a needle having a sharp distal tip;

bifurcating the needle to form at least one pair of arms defining a suture slot, the arms being movable between a proximate position associated with a first slot size and a spaced position associated with a second slot size greater than the first slot size;

penetrating the body wall with a needle assembly in the retracted position and the arms in the proximate position; and

advancing the needle assembly to the deployed position to move the arms to the spaced position associated with the second slot size.

Claim 23 The method recited in Claim 22 further comprising the step of:

forming a channel in one of the arms to provide for side-loading of the suture into the suture slot.

Claim 24 The method recited in Claim 23 wherein the slot has a proximal end and a distal end and the forming step includes the step of forming the channel in proximity to the distal end of the slot.

Claim 25 The method recited in Claim 23 wherein the slot has a proximal end and a distal end and the forming step includes the step of forming the channel in proximity to the proximal end of the slot.

Claim 26 The method recited in Claim 22 wherein the providing step further comprises the step of rounding at least the distal end of the slot.

Claim 27 The method recited in Claim 22 wherein the providing step includes the step of forming at least one proximally-facing shoulder on the needle to define the retracted position where the shoulder contacts the hollow shaft.